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AMERICAN TRUCKING ASSOCIATIONS

2200 Mill Road • Alexandria, VA 22314-4677

Law Department
(703) 838-1857

June 29, 1993

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JUN 29 1993

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

VIA MESSENGER

Ms. Donna Searcy
Secretary
Federal Communications Commission
1919 "M" Street, NW
Washington, D.C. 20554

Re: PR Docket No. 93-61, Comments in the Matter of Amendment of Part 90 of the Commission's Rules to Adopt Regulations for Automatic 16 Vehicle Monitoring Systems RM-8013.

Dear Ms. Searcy:

Enclosed for filing are a duly signed original and nine copies of the comments of the American Trucking Associations in the above proceeding.

Please date stamp the File Copy of the comments and return it with the messenger in the enclosed envelope.

Respectfully submitted,

Kenneth E. Siegel
Deputy General Counsel

Enclosures

No. of Copies rec'd 0+8
List A B C D E

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Dear Ms. Searcy:

On behalf of the American Trucking Associations, Inc. and its motor carrier members, (hereafter "ATA"), I am submitting the following comments on the recently released Notice of Proposed Rule Making ("NPRM") proposing changes to the rules pertaining to automatic vehicle monitoring ("AVM") systems.

The American Trucking Associations is the national trade association of the trucking industry. Through its 51 affiliated state trucking associations, located in every state and the District of Columbia, 10 affiliated conferences and national associations, 7 councils, and four thousand individual motor carrier members, ATA represents over 30,000 motor carriers of every size, type and class in the country. Many of ATA's members operate extensive radio systems licensed by the Federal Communications Commission in the Motor Carrier Radio Service. In addition, many of ATA's members utilize AVM systems that operate in the 902-928 MHz Band. ATA has continually represented the Motor Carrier Radio Service licensees' collective interests before the FCC.

The trucking industry is vital to commerce in the United States. In 1991, the trucking industry, as a whole, earned $278 billion gross freight revenues representing 77% of the nation's freight bill and 5% of the Gross National Product. Trucks haul 2.7 billion tons of freight, representing 42% of the total tonnage hauled by all modes of transportation. There are approximately 265,000 motor carriers in the United States, over 47,000 of which are motor carriers authorized by the Interstate Commerce Commission to haul goods for-hire interstate. These firms operate approximately 14.7 million commercial vehicles.

One of the ATA Councils is the Management Systems Council (MSC). The MSC is the national association composed of executives responsible for motor carrier management information systems (MIS), telecommunications, and electronic data processing. Formed in 1965, the Council is responsible for standards development and coordination in the areas of radio frequency identification (RFID), bar codes, electronic data interchange (EDI), Vehicle Maintenance Reporting Standards (VMRS), as well as other MIS related areas.

The MSC is very active in inter-industry coordination of standards. It is a member of the Standards and Protocols Committee of Intelligent Vehicle Highway Systems (IVHS) America, which is responsible for the coordination of standards as they relate to vehicle and infrastructure communications; a member of the American National Standards Institute (ANSI); a member of the Accredited Standards Committee X12 (ASC X12), which is responsible for U.S. and international EDI standards; chairman of one of X12's 12 Subcommittees; a member of International Standards Organization (ISO) Technical Committee 104 (TC104) and ISO TC154; a member of ANSI MH10, which is responsible for bar code standards; as well as an active participant in standards development for other industries.

We understand that the NPRM proposes that future use of the 904-912 MHz and 918-926 MHz portion of the radio frequency spectrum be given exclusively to PacTel/Teletrac and similar wide-band users. We believe that this exclusive authority, given to such wide-band systems, would significantly interfere with implementation of AVM technology by the members of our association.

In addition, while we support the work being done by PacTel/Teletrac and similar wide-band and narrow band users in the areas of AVM, we are concerned about one of the approaches suggested in the NPRM that would protect the first two licensees that are currently authorized. We agree with the comments of IVHS America, as stated in the NPRM, that this protection would lead to higher costs to the public, both in terms of use of the spectrum [illegible] nationally, regardless of whether such equipment moves by ship, rail, or highway.

Under the ATA standard, the previously listed items of equipment are outfitted with a transponder (tag). Readers are placed at various locations to record the movements of the equipment. While some of the applications may require only one or two such readers, others require multiple readers in the same general location. The ATA standard requires operation in the 902-928 MHz portion of the spectrum, with 912 MHz designed as the primary frequency. (A copy of the ATA standard is enclosed.)

Our members view this form of AVM as a major productivity multiplier that will aid the industry in maintaining the safe and efficient operation of fleets. For example, the trucking industry uses AVM tags to communicate when the vehicles pass through ports of entry from one state to another with little or no productivity loss from stopping. In response to the standards, trucking companies, railroads, ocean carriers, airports, and sea ports have all begun a program of tagging equipment and installing readers. For example, two of the largest truckload carriers, J.B. Hunt and Werner Enterprises, are in the process of installing ATA standard transponders on their entire fleets. In excess of 40,000 transponders are in active use today on commercial vehicles.

This same technology is being used to expedite the payment of the amount of the 902-928 MHz spectrum that is currently available for AEI applications, including spectrum at 904-912 and 918-926

Mhz. Accordingly, we request that the Commission deny PacTel's request.

Respectfully Submitted,

Kenneth E. Siegel
Deputy General Counsel

Enclosure (1)

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This same technology is being used to expedite the payment of tolls on major U.S. highways. Through a coordinated effort, a the amount of the 902-928 MHz spectrum that is currently available for AEI applications, including spectrum at 904-912 and 918-926 Mhz. Accordingly, we request that the Commission deny PacTel's request.

Respectfully Submitted,

Kenneth E. Siegel
Deputy General Counsel

Enclosure (1)

AMERICAN TRUCKING ASSOCIATIONS
STANDARD FOR AUTOMATIC EQUIPMENT IDENTIFICATION

May 16, 1990

0. Introduction and System Requirements

0.1 Scope

This American Trucking Associations (ATA) Standard specifies requirements for the automatic electronic identification of equipment used in road transportation, such as tractors, trailers, dollies, intermodal containers, and intermodal chassis (subsequently referred to as "equipment" in this document). The installation of this identification system on freight equipment is not a requirement for acceptance in road interchange service.

This document describes a reflected energy system in which sensing equipment shall decode radio waves reflected by an "Identification Tag" or "Transponder" mounted on equipment used in the transportation industry. The reflected radio waves shall indicate the identification code of the equipment as well as its related permanent information.

0.2 Field of Application

The identification system and data outputs described in this Standard shall be used to identify equipment by its individual alpha-numeric marking and other predefined information. The system and data outputs may be used, as appropriate, for the identification of other equipment whether or not used in road service.

0.3 References

- International Standards Organization, International Standards Organization (ISO) 6346 - Freight Containers - Coding, Identification and Marking

- International Standards Organization, ISO DIS 10374 - Draft International Standard for Automatic Identification of Containers

- Association of American Railroads (AAR) Automatic Equipment Identification Interim Standard, (Current Version)

- AAR Trailer and Container Service Rules 3, Reporting Marks and Numbering System

- Military Standard 810D, Environmental Test Methods and Engineering Guidelines

May 16, 1990

The Tag shall be capable of being programmed at truck facilities by user personnel.

The Tag attachment method shall be the choice of the user, bearing in mind the roadway environment and life expectancy of the Tag.

The Tag shall be sealed and meet or exceed at least the current version of the following environmental standards or their IEC equivalent:

a)	Low Temperature	Mil. Std. 810D Method 502.2; minimum temperature of -50 degrees C
b)	High Temperature	Mil. Std. 810D Method 501.2 Procedure II; cycled between +70 and +38 degrees C
c)	Mechanical Shock	Mil. Std. 810D Method 516.3 Procedure I; 30 g for 11 milliseconds, half sine pulse
d)	Random Vibration With Temperature	Mil. Std. 810D; Two hour duration/axis up to 3 g -50 degrees C ambient and +70 degrees C

recording locations, the Reader System shall be able to reliably record the passage of a properly presented Tag at distances of at least 42' (13 meters) from the Reader, at passage speeds up to 65 mph. In addition, the Reader System shall be able to discriminate individual tags and record the passage of properly presented Tags separated a distance of 5' (1.5m) or more and passing

1. System Operation

1.1 Components

The radio communication system described herein consists of a Reader System (i.e., Reader, RF Module, and Antenna) and Tags. Tags are placed on objects to be identified, and Readers, Antennas, and RF Modules are installed at points to record the passing of tagged objects. The system is designed for localized application where the Tag passes by the Reader System (either the Tag or Reader may be moving).

1.2 Interconnection

The block diagram of Figure 1 indicates the function of each component. The RF Module transmits an unmodulated signal in the direction of a Tag (f_o). The Tag reflects a modulated signal back to the RF Module (f_{om}). The RF Module receives the reflected signal from the Tag and relays this information to the Reader. The Reader decodes the information transmitted in the reflected signal from the Tag and relays the information to a host computer for subsequent use to identify, track and schedule the tagged objects.

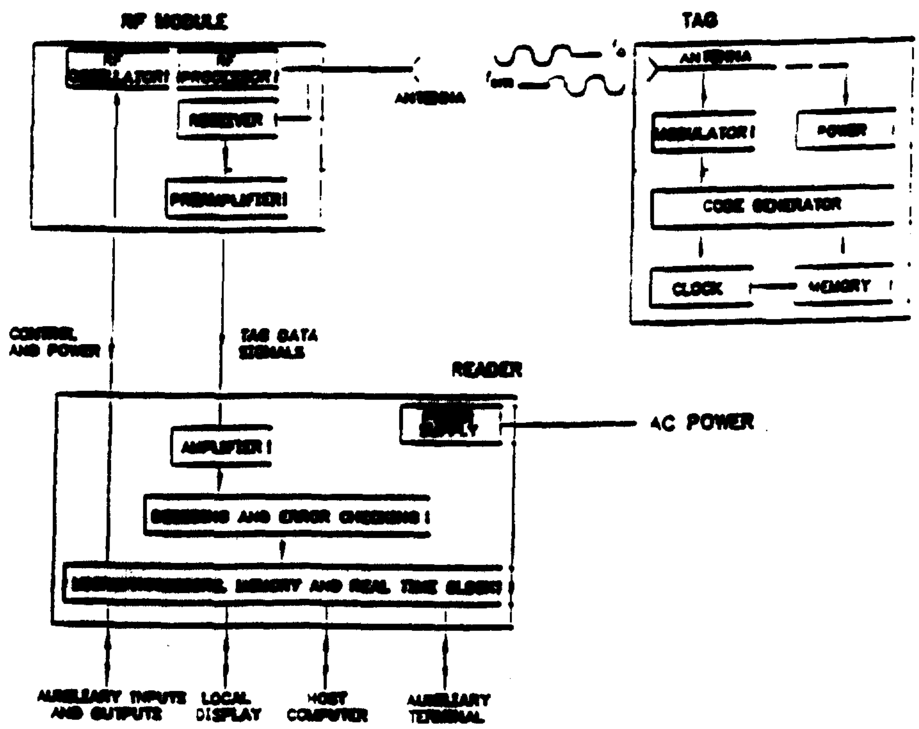


Figure 1. Block Diagram of the RF Module, Reader, Antenna and Tag

1.3 Tag

The Tag shall not be a transmitter and shall not contain components to generate radio frequency (RF) signals. The Tag must act merely as a field disturbance device, slightly modifying and reflecting the signal transmitted by the Reader System. This slight modification of the signal includes the unique identification code of the Tag.

1.3.1 The Tag shall be composed of the Clock, Code Generator, Memory, Antenna circuits, Modulator, Power. The Clock circuit sequences all circuit functions such that information stored in the Memory circuit is conveyed to the Reader System within precise timing. The information stored in the Memory circuit is permanent, and is a unique code which is specified by the [redacted]

Description	Typical Specifications
Maximum RF power (measured at transmitter)	2.0 Watts
Standard transmit and receive frequency	912 MHz
Other frequencies available	902 to 928 MHz
Frequency stability	0.0005 percent
Harmonic output	-50 dBc
Spurious output	-60 dBc
Transmitter bandwidth	5 kHz
Receiver bandwidth	130 kHz
Frequency separation for Reader Systems in close proximity	2 MHz

1.5 Reader

The RF Module receives the modulated signal from the Tag and passes the 20 and 40 kHz modulating frequencies to the Reader. The Reader shall decode the frequencies into binary information equivalent to the 128 bits of data stored in the Tag. The Reader is composed of the Amplifier, Decoding and Error Checking

May 16, 1990

2. Tag to Sensing Equipment Communication

2.1 The encoding of user data bits shall include 8 sub-bits for each user bit. A sub-bit shall be in coded by the Tag and decoded by the sensing equipment with a modified FSK (frequency shift keying) code using two harmonically related frequencies, one (40 kHz) being the exact double of the other (20 kHz), with a frequency tolerance of ±10%. A "0" bit shall consist of one 20 kHz square wave cycle followed by two 40 kHz square wave cycles. A "1" bit shall consist of two 40 kHz square wave cycles followed by a 20 kHz square wave cycle. All transitions shall

2.3 The Tag shall use the coded identification data and related permanent information to amplitude-modulate the incoming continuous wave radio frequency carrier signal from the sensing equipment. The resulting modified FSK signal (carrier and sidebands) shall be reflected by the Tag, received by the sensing equipment for decoding, and, after decoding, made available to computerized data processing systems. The modulation polarity shall be of no consequence.

3. Tag Frequency of Operation and Sensitivity

3.1 The Tag shall survive and maintain the integrity of its encoded data in a maximum peak field strength of 50 V/m for 60 seconds, as may be encountered from any radio frequency source such as voice communications equipment.

3.2 A Tag shall be operational within four milliseconds of excitation by an interrogating signal from the sensing equipment.

3.3 When a properly presented Tag is excited as indicated by an incident wave at a given reference range, it shall respond within the following modulated return signal strength, exclusive of carrier and as measured at the same reference range:

unauthorized duplication of Tags. Twenty-six bits are used for procedural needs and 102 bits are available for general use.

4.2 Bits reserved for Procedural Needs

A listing of the fields reserved for procedural needs is presented in Table A.

Table A: Allocation of Fields Required for Procedural Needs

Field Designation	Bit Position (out of a possible 0 to 127)
First Check Sum	60, 61
Reserved Frame Marker	62, 63
Security	106-117
Format Code	118-123
Second Check Sum	124, 125
Frame Marker	126, 127

4.2.1 First Check Sum: There are three methods of error detection which are derived exclusively from the Tag data and the way this data is conveyed to the Reader. The Check Sum fields are used in one of the methods to detect errors in the data received by the Reader. The First Check Sum is calculated by adding bits 0 through 59 and truncating all but the right-most two bits of the binary resultant. This calculation is done automatically by the Tag Programmer at the instant the Tag is programmed. When the Reader acquires Tag information, it checks these two bits against its own calculation of Check Sum from the received tag information to determine if there is an error in the previous 60 bits.

4.2.2 Reserved Frame Marker: Reserved for future use as a Frame Marker.

4.2.3 Security: These 12 bits are reserved for Security purposes, although if Security is not desired, these bits can be designated for limited general use. The Security field is divided into two six-bit fields. For Security applications, the two fields may contain any combination of the values presented in Table B or one field must contain a Security value and the other field may contain any value in Tables B or C. If the user requires security, a unique security character will be assigned to the user's Tag Programmer or the security field can be programmed at the factory.

4.2.4 Format Code: The format code indicates the type of coding scheme utilized for the bits defined for general use. The following binary format

Table B: Reserved Security Values

Six-Bit ASCII Character	Decimal Value	Six-Bit ASCII Character	Decimal Value	Six-Bit ASCII Character	Decimal Value
!	1	)	9	?	31
"	2	+	11	@	32
#	3	,	12	[	59
$	4	:	26	\	60
%	5	;	27	]	61
&	6	<	28	^	62
'	7	=	29	_(underline)	63
(	8	>	30		

If the user does not require Security then the two fields can contain any combination of the values shown in Table C.

Table C: Non-Secure Data Values

Six-Bit ASCII Character	Decimal Value	Six-Bit ASCII Character	Decimal Value	Six-Bit ASCII Character	Decimal Value
(space)	0	9	25	N	46
*	10	A	33	0	47
-	13	B	34	P	48
.	14	C	35	Q	49
/	15	D	36	R	50
0	16	E	37	S	51
1	17	F	38	T	52
2	18	G	39	U	53
3	19	H	40	V	54
4	20	I	41	W	55
5	21	J	42	X	56
6	22	K	43	Y	57
7	23	L	44	Z	58
8	24	M	45		

codes have been assigned (most significant bit on the left):

000000: Indicates six-bit ASCII format. This format partitions the General Use area into contiguous six-bit fields into which any character indicated in Tables B or C above can be programmed.

110011: This data format is defined by the International Standards Organization Draft International Standard DIS 10374 and DIS 10374 Addendum 1, the Association of American Railroads Interim Standard (Current Version), and the American Trucking Associations Standard for Automatic Equipment Identification. These standards guarantee that the Data Format, Tag Type, Check Sums, Frame Markers, Equipment Group Code and Security fields will be fixed for all types of referenced equipment and will be uniformly positioned and defined. Other fields, such as the Owner's Code and Length, may expand, contract, or change definition from one type of equipment to the next.

110100: This value indicates a Tag format programmed for toll road use.

There are a total of 61 additional values which have not been assigned and are reserved for future use. Throughout this document, the term "reserved" implies that the value should not be assigned by the User or Owner for his own purposes; the value may be assigned by the [illegible]A, a standards organization or some other regulatory group.

4.2.5 <u>Second Check Sum:</u> Similar function and method of calculation as the First Check Sum except that it is used to help verify the data integrity of Tag bits 62 to 123.

4.2.6 <u>Frame Marker:</u> These two bits contain a special unique signature, which is neither a one nor a zero, and are used to indicate the start of the next frame.

4.2.7 <u>General Use Fields:</u> The allocation and definition of Tag data bits available for general use are specified in the following appendices:

Appendix A - Tractor
Appendix B - Dolly
Appendix C - Trailer
Appendix D - Chassis
Appendix E - Intermodal Container

4.2.7.1 <u>Physical Measurements:</u> All physical measurements (such as length, height, weight, etc.) specified in Appendices A through E shall be integer numbers and shall be encoded into the Tag in metric units. Fractions shall be rounded to the next higher integer.

4.2.7.2 Trailing Blanks: Trailing blanks shall be employed in the Standard Carrier Alpha Code (e.g., Owner's Code) and Identification Number, and leading zeros shall be used on numeric data fields.

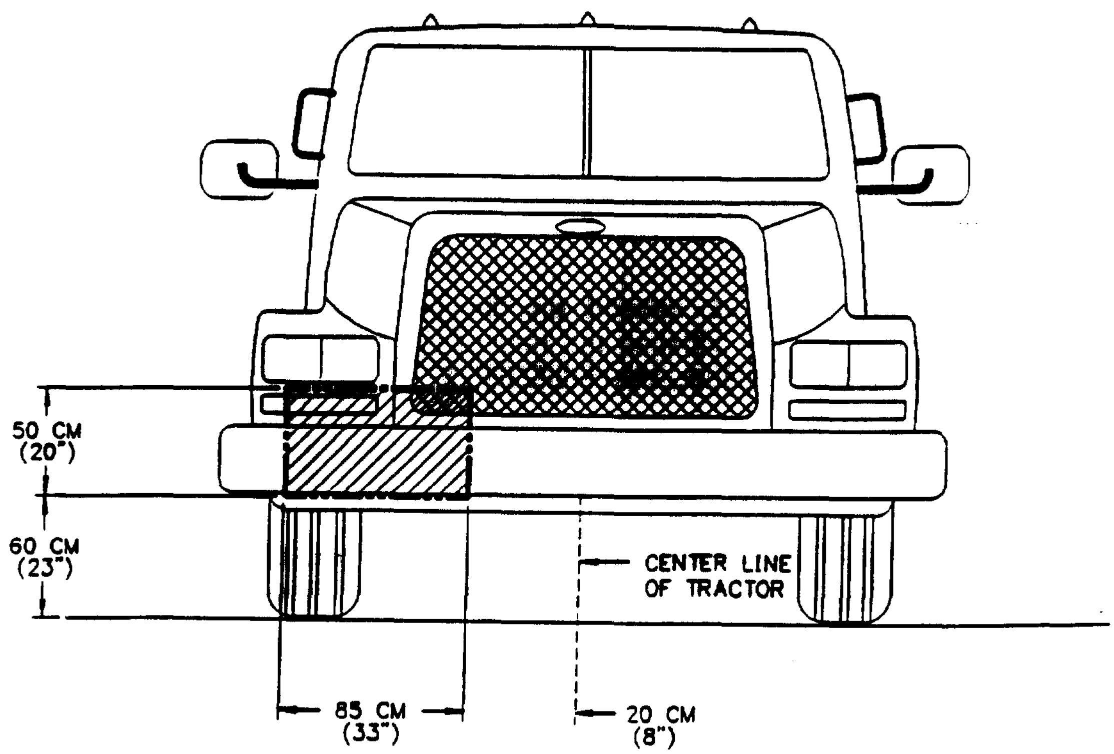
5. Location and Mounting of Tags on Equipment

The Tag shall be capable of permanent mounting and shall have nominal dimensions which do not exceed 30 x 6.0 x 2.0 cm. The Tag shall be attached to a metal surface (or metal plate that is then attached to the equipment). The metal surface should be flat and have a surface area which exceeds the surface dimensions of the Tag by at least 50%.

5.1 Tractor

The Tag shall be mounted on the front surface of the tractor on the right side, in the vicinity of the front bumper. The Tag may be located in a placement window which extends horizontally from 30 cm (1 foot) to 90 cm (3 feet) to the right of the bumper's centerline, and extends vertically from 60 cm (2 feet) to 105 cm (3.5 feet) above the ground, see FIGURE 3.

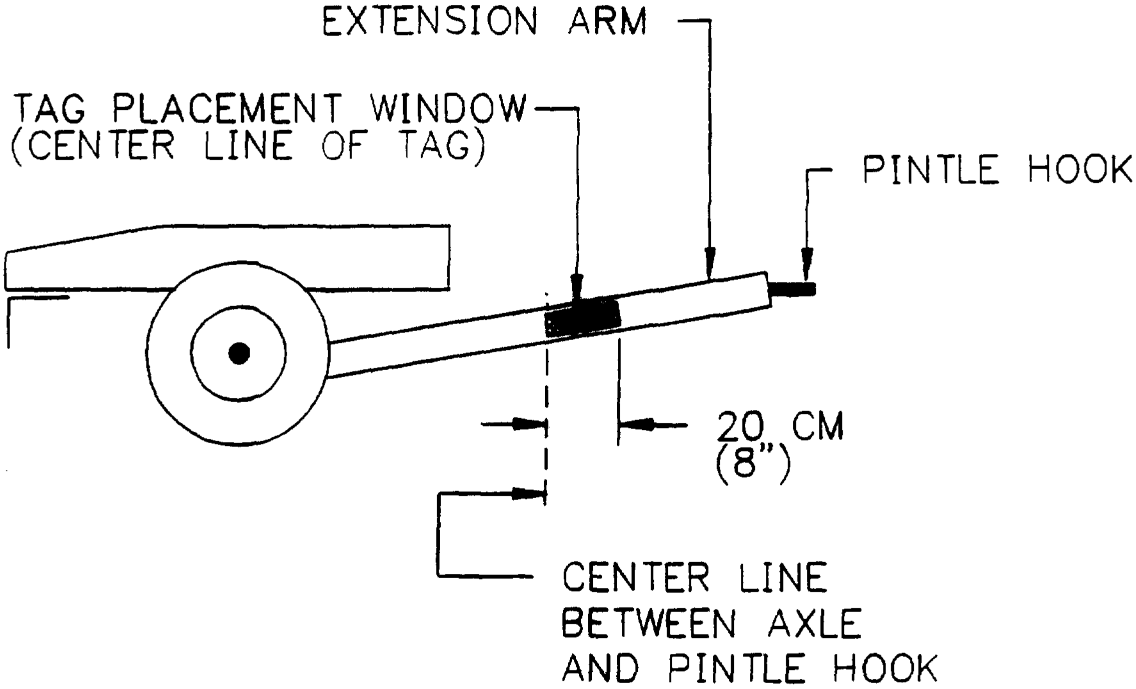
The Tag shall be facing forward and shall be installed horizontally to respond to a horizontally polarized signal from the Reader System.



TRACTOR TAG PLACEMENT
FIGURE 3

5.2 Dolly

The Tag shall be positioned on the right extension arm, facing outward, with the Tag being located midway between the axle and the pintle hook (with a tolerance of -0 cm or +20 cm toward hook) such that it will respond to a horizontally polarized signal from the Reader System, see FIGURE 4.



DOLLY TAG PLACEMENT
FIGURE 4

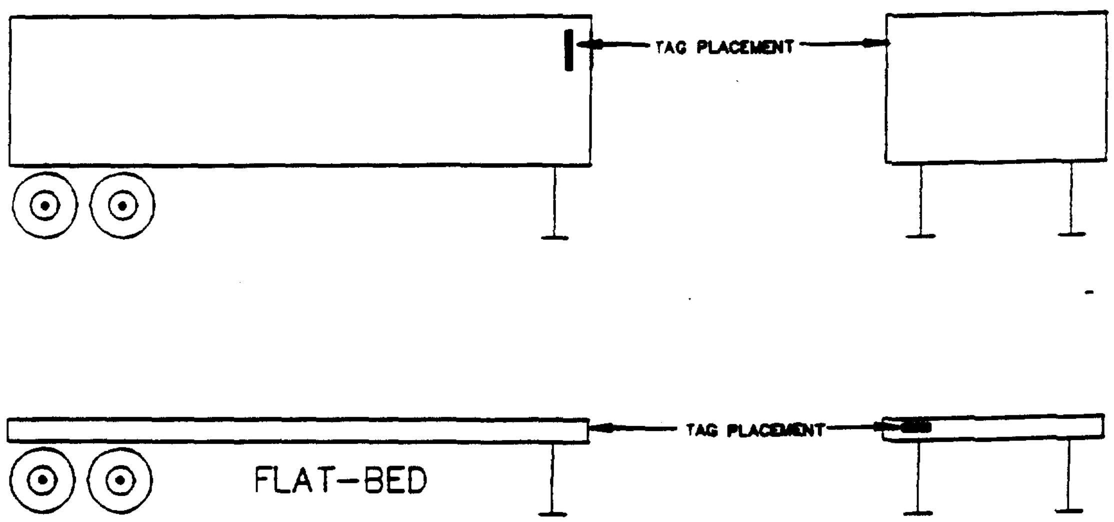
5.3 Trailer

The Tag shall be located on the forward right sidewall of the trailer approximately 30 cm (1 foot) to the rear of the front of the trailer centered 30 cm (1 foot) below the roof line, see FIGURE 5.

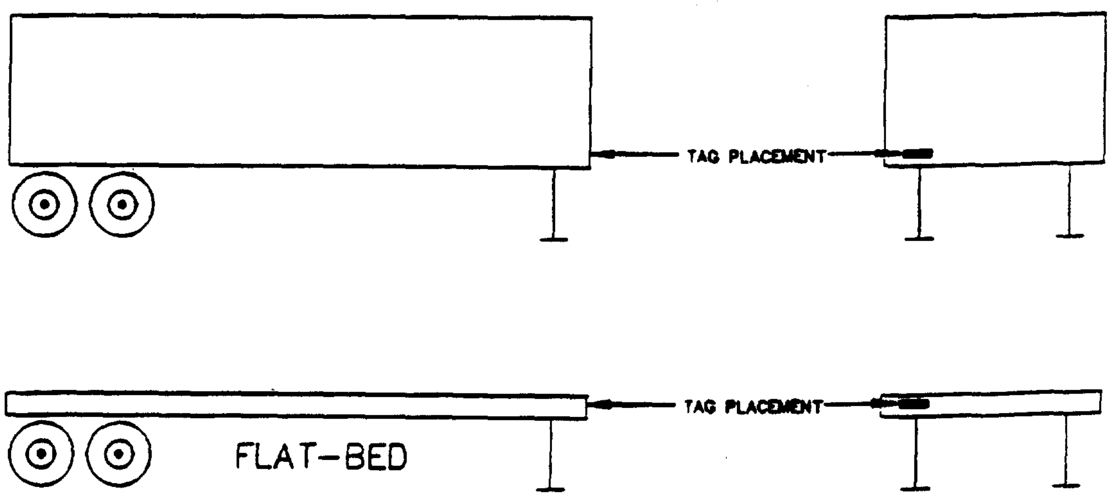
The Tag shall be mounted vertically so that it will respond to a vertically polarized signal from the Reader System.

For flatbed trailers and for other situations where the above mounting location trailer's right side to a point 60 centimeters (2 feet) toward the center of the trailer and extends vertically from the bottom surface of the trailer to a point 30 centimeters (1 foot) above the bottom surface, see FIGURES 5 and 6.

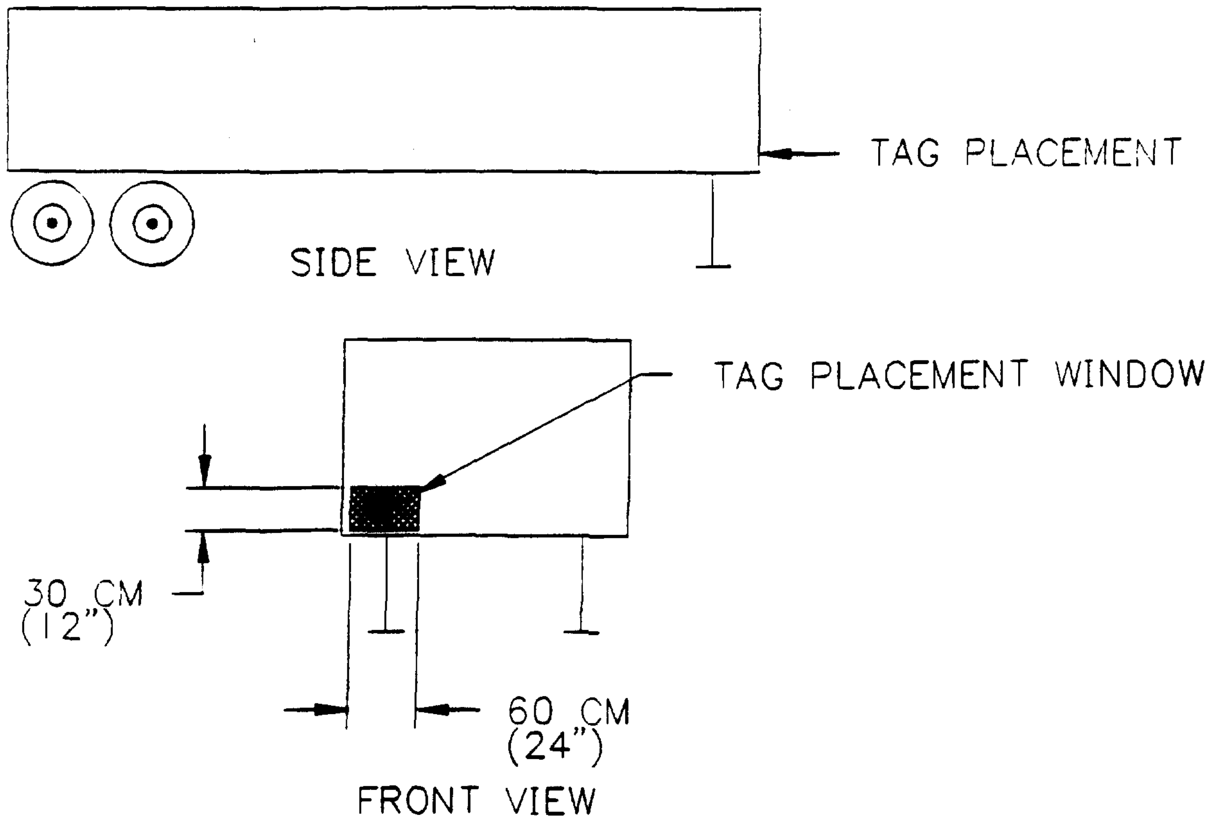
In this second configuration, the Tag shall be facing forward and shall be positioned horizontally to respond to a horizontally polarized signal from the Reader System.



RECOMMENDED TAG PLACEMENT



ALTERNATIVE TAG PLACEMENT
TRAILER TAG PLACEMENT
FIGURE 5



TRAILER TAG PLACEMENT
FOR ALTERNATIVE TAG LOCATION
FIGURE 6

5.4 Chassis

The Tag shall be located on the right hand front corner of the forward bolster. The Tag will be oriented in a forward direction, see FIGURE 7.

The Tag shall be mounted horizontally so that it will respond to a horizontally polarized signal from the Reader System.

5.5 Container

For containers 40 feet in length or less, the equipment Tag shall be located on the forward right sidewall of the container, approximately one foot to the rear of the front corner post within the first corrugation (if applicable), centered one foot below the roof line of the vehicle, see FIGURE 8. For installation on equipment without sidewalls (e.g., tanks, platform, and rack configurations), the Tag may be